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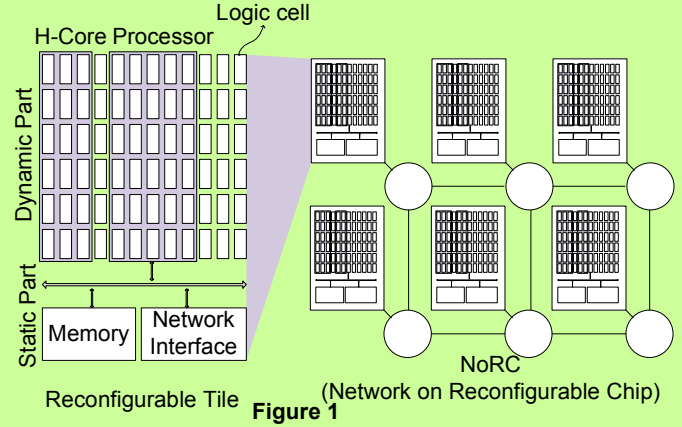
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ABSTRACT

This poster investigates the challenges of run-time resource management in future coarse-grained network-on-reconfigurable-chips (NoRCs). Run-time reconfiguration is a key feature expected in future processing systems which must support multiple applications whose processing requirements are not known at design time. This paper investigates a stochastic routing algorithm in a NoC-based system with dynamically reconfigurable tiles, able to cope with the dynamic behaviour of run-time task mapping. Experimental results show the efficiency of the proposed stochastic task mapping.

NETWORK ON RECONFIGURABLE CHIP



PROPOSED RANDOM ROUTING

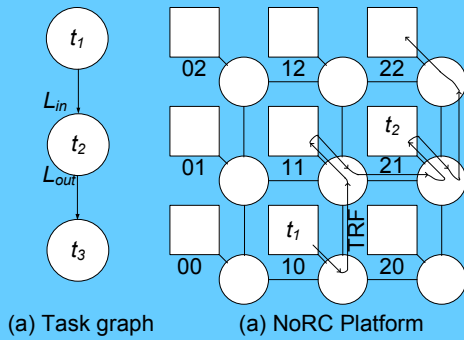


Figure 2

TASK MAPPING GUIDELINES

The random walk should follow the following constraints to be able to map a task to a Partially Reconfigurable Region (PRR), efficiently.

Constraint 1: Finding an existing task

Constraint 2: Finding a PRR which fits the task

Constraint 3: Minimize the communication overhead between two communicating tasks

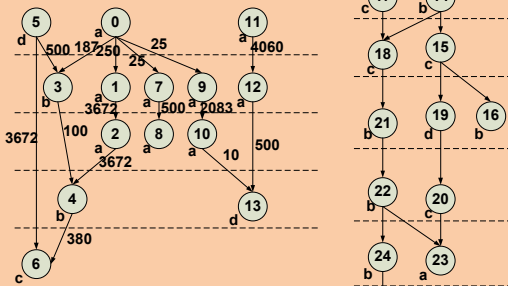
We define a few metrics to numerically denote these constraints. Network interface of tiles save these numbers as guidelines for the randomly travelled flit.

PRR factors: PR number (PRN) and PR distance (PRD) factors

Task factors: Task number (TN) and Task distance (TD) factors

EXPERIMENTAL RESULTS

To evaluate the proposed technique, we simulate 10000 times the two applications shown in Figure 3(a), (b). The *App1* and *App2* application task graphs are based on the task graphs of a 263 decoder mp3 decoder (*App1*), a multi-window display (MWD) (*App2*).



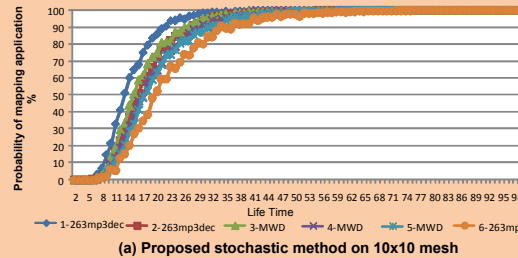
(a) App1: 263 mp3 decoder

(b) App2: MWD

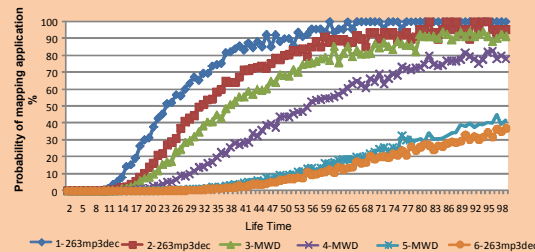
4	b	c	a	b	b
3	c	c	b	b	b
2	a	c	b	d	a
1	a	d	d	c	a
0	b	a	a	a	a
	0	1	2	3	4

(c) mesh 5x5
PRR
distribution

Figure 3

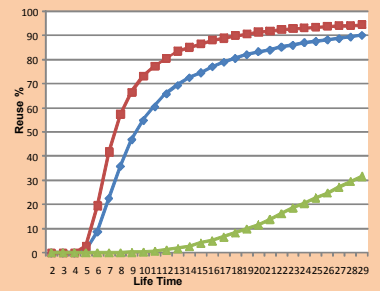


(a) Proposed stochastic method on 10x10 mesh

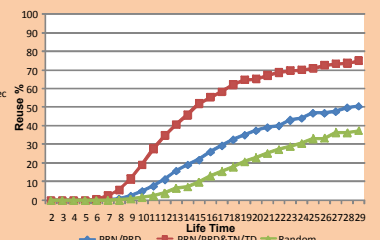


(b) Random walk method on 10x10 mesh

Figure 4



(a) Mapping of MWD on 5x5 mesh



(b) Mapping of MWD on 10x10 mesh

Figure 5